

Remarks

Applicants respectfully request reconsideration of the present U.S. Patent application as amended herein. Claims 1, 12, 18 and 20 have been amended. No claims have been added or canceled. Thus, claims 1-37 are pending.

CLAIM REJECTIONS - 35 U.S.C. § 102(b) - Ueda

Claims 1-37 were rejected as being anticipated by U.S. Patent No. 5,175,618 issued to Ueda, et al. (*Ueda*). For at least the reasons set forth below, Applicants submit that claims 1-37 are not anticipated by *Ueda*.

Claim 1 recites:

utilizing even-parity field prediction to unidirectionally predict content of each of a plurality of fields of the predicted frame from corresponding fields of only the temporally closest anchor frame, *wherein the unidirectionally predicted frame comprises a frame that is defined as a bi-directionally predicted frame according to an encoding protocol for the stream of data.*

Thus, Applicants claim using unidirectional prediction to predict the contents of a frame that is *defined as a bi-directionally predicted frame by the encoding protocol* being used for the stream of data.

Use of unidirectional prediction rather than bi-directional prediction results in computational savings. See, for example, the Specification at page 19, lines 11-15. For example, using MPEG-2 encoding B-frames can be encoded using even-parity field prediction to unidirectionally predict fields using a temporally closest P-frame or I-frame.

As a preliminary matter, Applicants note that *the Office Action mailed January 6, 2004 does not even address the limitation* of the unidirectionally predicted frame

being a frame that is defined as a bi-directionally predicted frame according to the encoding protocol for the stream of data. Therefore, Applicants submit that the rejection provided in the Office Action mailed January 6, 2004 is incomplete.

Nevertheless, Applicants submit that *Ueda* fails to anticipate the claimed invention because *Ueda* does not disclose a unidirectionally predicted frame that is defined as a bi-directionally predicted frame according to the encoding protocol. *Ueda* discloses motion compensation and inter-field prediction “as the conventional manner.” See col. 7, lines 10-13. Therefore, *Ueda* not only does **not** disclose unidirectional prediction for a frame that is defined as a bi-directionally predicted frame according to the encoding protocol, but *Ueda* explicitly discloses following the encoding protocol for motion compensation and prediction.

Claims 2-11, 31, 32 and 33 depend from claim 1. Because dependent claims include the limitations of the claims from which they depend, Applicants submit that claims 2-11, 31, 32 and 33 are not anticipated by *Ueda* for at least the reasons set forth above.

Claim 12 recites:

a motion estimation circuit to receive a stream of data comprising at least an anchor frame and a predicted frame, and to utilize even-parity field prediction to unidirectionally predict content of each of a plurality of fields of the predicted frame from corresponding fields of a temporally closest anchor frame in the stream of data, ***wherein the unidirectionally predicted frame comprises a frame that is defined as a bi-directionally predicted frame according to an encoding protocol for the stream of data.***

Thus, Applicants claim a motion estimation circuit that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used.

As discussed above, *Ueda* discloses conventional frame prediction and motion compensation. Therefore, *Ueda* does not disclose a motion estimation circuit as claimed in claim 12.

Claims 13-17, 34 and 35 depend from claim 12. Because dependent claims include the limitations of the claims from which they depend, Applicants submit that claims 13-17, 34 and 35 are not anticipated by *Ueda* for at least the reasons set forth above.

Claim 18 recites:

A storage medium comprising a plurality of executable instructions which, when executed, causes an executing processor to implement a motion estimation function to utilize even-parity field prediction to unidirectionally predict content of each of a plurality of fields of a predicted frame from corresponding fields of a temporally closest anchor frame, ***wherein the unidirectionally predicted frame comprises a frame that is defined as a bi-directionally predicted frame according to an encoding protocol for the stream of data.***

Thus, Applicants claim a storage medium having instructions to implement motion estimation that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used. Claims 19, 36 and 37 depend from claim 18.

As discussed above, *Ueda* discloses conventional frame prediction and motion compensation. Therefore, *Ueda* does not disclose a storage medium having instructions to implement motion estimation as claimed in claims 18, 19, 36 and 37.

Claim 20 recites:

predicting, unidirectionally, content of each of a plurality of fields in non-reference frames and select reference frames using information contained in merely corresponding fields of a single past or subsequent, temporally closest, reference frame, *wherein the unidirectionally predicted non-reference frames comprise a frame that is defined as a bi-directionally predicted frame according to an encoding protocol for the stream of data.*

Thus, Applicants claim motion estimation that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used. Claim 30 is directed to a storage medium comprising a plurality of executable instructions which, when executed by a computing system, cause the computing system to implement a method according to claim 20.

As discussed above, *Ueda* discloses conventional frame prediction and motion compensation. Therefore, *Ueda* does not disclose a motion estimation circuit as claimed in claims 20 and 30.

Claims 21-29 depend from claim 20. Because dependent claims include the limitations of the claims from which they depend, Applicants submit that claims 21-29 are not anticipated by *Ueda* for at least the reasons set forth above.

CLAIM REJECTIONS - 35 U.S.C. § 102(b) - *Igarashi*

Claims 1-37 were rejected as being anticipated by U.S. Patent No. 5,666,461 issued to *Igarashi, et al. (Igarashi)*. For at least the reasons set forth below, Applicants submit that claims 1-37 are not anticipated by *Igarashi*.

As discussed above, claim 1 recites using unidirectional prediction to predict the contents of a frame that is *defined as a bi-directionally predicted frame by the encoding*

protocol being used for the stream of data. Claim 12 is directed to a motion estimation circuit that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used. Claim 18 is directed to a storage medium having instructions to implement motion estimation that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used. Claim 20 is directed to motion estimation that performs field prediction to unidirectionally predict a frame that is defined as a bi-directionally predicted frame according to the encoding protocol used. Claim 30 is directed to a storage medium comprising a plurality of executable instructions which, when executed by a computing system, cause the computing system to implement a method according to claim 20.

Igarashi discloses selection between frame-based predictive coding and field-based predictive coding. See col. 7, lines 42-46. Frame-based predictive coding and field-based predictive coding can be used for either forward or backward prediction. See col. 21, lines 43-60. Further, *Igarashi* labels bi-directionally predicted (according to the MPEG standard) frames as B frames that are coded using one or both of a temporally preceding (past) picture and a temporally succeeding (future) picture as reference pictures. See col. 1, lines 58-61. However, *Igarashi* does not disclose using unidirectional prediction to predict the contents of a frame that is defined as a bi-directionally predicted frame by the encoding protocol being used. Therefore, *Igarashi* does not anticipate the invention as claimed in claims 1, 12, 18, 20 and 30.

Claims 2-11, 31, 32 and 33 depend from claim 1. Claims 13-17, 34 and 35 depend from claim 12. Claims 19, 36 and 37 depend from claim 18. Claims 21-29

depend from claim 20. Because dependent claims include the limitations of the claims from which they depend, Applicants submit that claims 2-11, 13-17, 19, 21-29 and 31-37 are not anticipated by *Igarashi* for at least the reasons set forth above.

CLAIM REJECTIONS - 35 U.S.C. § 103(a)

Claims 1-37 were rejected as being unpatentable over U.S. Patent No. 5,293,229 issued to Iu (*Iu*) in view of *Ueda*. As discussed above, *Ueda* not only does **not** disclose unidirectional prediction for a frame that is defined as a bi-directionally predicted frame according to the encoding protocol, but *Ueda* explicitly discloses following the encoding protocol for motion compensation and prediction.

Iu discloses a variation on I, P and B fields as defined by the MPEG standard. See col. 3, lines 3-5. However, this variation substitutes B fields for I or P fields. See col. 3, lines 5-7. Thus, *Iu* discloses bi-directional prediction where the MPEG standard defines unidirectional prediction or no prediction. Accordingly, *Iu teaches away* from the claimed invention by teaching the **opposite** variation on an encoding standard. Therefore, not only does *Iu* not cure the deficiencies of *Ueda* as set forth above, *Iu* teaches increasing the number of bi-directionally encoded frames. Applicants therefore submit that no combination of *Ueda* and *Iu* can teach or suggest the invention as claimed in claims 1-37.

CONCLUSION

For at least the foregoing reasons, Applicants submit that the rejections have been overcome. Therefore, claims 1-37 are in condition for allowance and such action is earnestly solicited. The Examiner is respectfully requested to contact the undersigned by

telephone if such contact would further the examination of the present application.

Please charge any shortages and credit any overcharges to our Deposit Account number
02-2666.

Respectfully submitted,
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